

Exhibit A

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August 3, 2005

BY EDGAR AND BY HAND

Jay Mumford, Esq.
Thomas A. Jones, Esq.
Securities and Exchange Commission
450 Fifth Street, N.W.
Washington, D.C. 20549

Re: Veeco Instruments Inc.
Form 10-K for Fiscal Year Ending December 31, 2004
Filed March 16, 2005
File No. 0-16244

Dear Messrs. Mumford and Jones:

This letter is submitted on behalf of Veeco Instruments Inc. (the "Company") in response to the comments of the staff (the "Staff") of the Division of Corporation Finance of the Securities and Exchange Commission with respect to the Company's Form 10-K for Fiscal Year Ending December 31, 2004 (File No. 0-16244), as set forth in your letter to John F. Rein, Jr. dated July 28, 2005.

The text of each comment contained in the Staff's letter is set forth in italics below, followed by the Company's response.

Form 10-K for the Fiscal Year Ended December 31, 2004**Item 3. Legal Proceedings, page 16**

1. *In future filings, please quantify, if material, the amount of your revenues from the asserted invalid and unenforceable patents and the amount of royalties sought by Asylum.*

RESPONSE: In its lawsuit against Asylum, the Company has alleged that Asylum infringes five of the Company's patents (the "Asserted Patents") covering technology related to scanning probe microscopes ("SPMs") and/or atomic force microscopes ("AFMs"). The five Asserted Patents represent a small portion of

New York Chicago Los Angeles Washington, D.C. West Palm Beach Frankfurt London Shanghai

the Company's portfolio of over 100 patents covering SPMs and AFMs. Multiple patents may apply to each of the Company's SPM and AFM products. In general, the Company does not derive royalties from the Asserted Patents, and does not allocate product revenue to the Asserted Patents. As such, it is impractical to quantify the amount of revenues derived from the Asserted Patents.

Furthermore, the Company views Asylum's claims of invalidity and unenforceability as nothing more than standard defenses in a patent infringement action. The Company believes these claims are without merit and intends to vigorously oppose these claims.

The amount of royalties sought by Asylum is not material.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations, page 21

2. *On pages 26, 29 and 30 of your MD&A and on page 15 of your Form 10-Q for the Quarter Ended March 31, 2005, you disclose non-GAAP financial measures consisting of gross profit excluding certain items. While these disclosures may be helpful in describing operating results from period to period, they remove focus from the excluded items. Please revise future filings to discuss changes in your GAAP-based results, identifying those unique or material transactions or events that contributed to the changes. Alternatively, if you elect to retain the current disclosures, revise future filings to comply with the requirements of Item 10(e) of Regulation S-K. We refer you to SEC Release 34-47226. Please provide us with a sample of the disclosures you intend to include in future filings. Please note this comment also applies to your Form 10-Q as of March 31, 2005.*

RESPONSE: The Company accepts the Staff's comment and will revise future filings to disclose changes in gross profit only on a GAAP basis. As requested, the following paragraph is the disclosure the Company anticipates including in its Form 10-Q for the quarterly period ended June 30, 2005, pertaining to changes in gross profit.

Gross profit for the six months ended June 30, 2005 was 41.0%, as compared to 40.9% in the comparable period of 2004. Gross profit in 2004 was negatively impacted by \$1.5 million in purchase accounting adjustments relating to the acquisitions of TurboDisc and Aii. These purchase accounting adjustments resulted from the required capitalization of profit in inventory and the permanent elimination of certain deferred revenue. The ion beam and mechanical process equipment gross margins were 40.2% in the first six months of 2005, as compared to 34.9% in the same period in 2004. The increase was primarily due to increased volume, favorable price mix and cost cutting measures at the Plainview ion beam facility during the six months ended June 30, 2005 and the effect of the \$1.5 million in purchase accounting adjustments in 2004 described above. Epitaxial process equipment gross margins in the first six months of 2005 were 20.4%, as

compared to 21.3% in the prior year period. This decrease was primarily due to higher warranty expenses for MOCVD products and an unfavorable product mix in MBE products. Metrology gross margins decreased from 54.0% in the first six months of 2004 to 50.7% in the first six months of 2005 due to less favorable product mix of AFM products.

Item 9A. Controls and Procedures, page 45

3. *We note your disclosure that “as a result of the discovery by management of improper accounting entries made at its TurboDisc business unit which led to adjustments requiring the restatement of the Company’s financial statements for the quarterly periods ended March 31, 2004, June 30, 2004 and September 30, 2004, management has now determined that a deficiency existed in the internal control over financial reporting at the end of such quarterly periods.” We also note your disclosure on page F-40 of your financial statements that “there was no evidence found of embezzlement or diversion of corporate assets” as a result of your internal investigation. Please respond to the following comments:*

- *Tell us in greater detail the nature of the improper accounting entries.*
- *Please tell us what your investigation concluded as to the reasons why these improper accounting entries were made.*
- *Clarify whether this issue was determined to be a significant deficiency or a material weakness, as those terms are defined in paragraphs 9-10 of PCAOB Auditing Standard No. 2. Please provide us with a basis for the determination.*
- *Describe in detail the specific corrective actions you have taken. Tell us what you mean when you discuss the implementation of “a new accounting system and attendant control process.” Describe the new controls put in place and why you believe these will prevent future occurrences.*

RESPONSE: The improper accounting entries at the TurboDisc business unit discovered by the Company’s internal audit staff and corporate financial management included entries in the accounts relating to inventory (including work in process, labor and overhead, research and development projects and certain other accounts), revenue (including sales and material), accounts receivable (including accounts relating to amounts due from Emcore Corporation), accounts payable (including accounts relating to payments due to Emcore Corporation and certain other vendors), warranty reserve, accrued expenses and deferred gross profit.

The investigation concluded that there were not sufficient facts to come to a conclusion on whether the improper accounting entries were made intentionally or, assuming such entries were made intentionally, what motive the former Controller of TurboDisc (the individual found to have been responsible for such entries) may have had in making such entries.

In accordance with Section 404 of the Sarbanes-Oxley Act of 2002, management of the Company assessed the design and effectiveness of internal control over financial reporting and concluded in its Report on Internal Control Over Financial Reporting that it believes that the Company maintained effective control over financial reporting as of December 31, 2004, the date as of which such assessment is required to be made under Section 404. In addition, the Company's independent registered public accounting firm, Ernst & Young LLP, reported that the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2004, based on the "COSO criteria."

As a result of the discovery by management of the improper accounting entries at the TurboDisc business unit which led to adjustments requiring the restatement of the Company's financial statements for the quarterly periods ended March 31, 2004, June 30, 2004 and September 30, 2004, management determined that a deficiency existed in the internal control over financial reporting at the end of such quarterly periods. However, since such discovery occurred after the end of such quarterly periods management was not required to, and did not, determine whether the nature of the deficiency was a significant deficiency or a material weakness (as such terms are defined in paragraphs 9-10 of PCAOB Auditing Standard No. 2) at the end of such quarterly periods. In addition, management concluded that the corrective actions taken by it remedied the deficiency in control over financial reporting that led to the restatement and, as described above, that Veeco maintained effective control over financial reporting, and that no material weaknesses or significant deficiencies existed, as of December 31, 2004.

The corrective actions taken in connection with the discovery of the improper accounting entries at the TurboDisc business unit consisted of the termination or reassignment of personnel and the implementation of a new accounting software system at the business unit. More specifically, the Company effectuated a management reorganization of its epitaxial process equipment group, which consists of the TurboDisc business unit, located in Somerset, New Jersey, and the Molecular Beam Epitaxy ("MBE") business unit, located in St. Paul, Minnesota. In the reorganization, the General Manager of the epitaxial process equipment group was replaced, the controller of the TurboDisc business unit was

replaced and new management positions were created, including General Manager of the TurboDisc business unit and General Manager of the St. Paul MBE business unit. Previously, a single manager presided over the TurboDisc business unit and the St. Paul MBE business unit.

At the time of the Company's acquisition of substantially all of the assets of TurboDisc from Emcore Corporation in November 2003, Emcore's accounting system utilized accounting software from JD Edwards. At that time, the Company's other businesses utilized accounting software from other vendors and the Company was in the process of transitioning all of its business units to an accounting system utilizing accounting software from SAP. It was determined at the time of the acquisition that TurboDisc would continue utilizing the JD Edwards software (which was not utilized by any other Veeco business unit) until such time as TurboDisc could be transitioned to the SAP accounting software system, which the rest of the Company would be using. The transition to the SAP accounting software system took place at TurboDisc in November 2004. At the same time, the responsibility for maintaining the general ledger at the TurboDisc business unit was moved from the controller at TurboDisc to the newly created position of group controller of the epitaxial process equipment group. It was principally as a result of these two events that the internal audit staff and corporate financial management began to become aware of the improper accounting entries.

Management believes that the personnel changes and additional supervisory management positions created, together with the improved reporting and control gained as a result of the transition of TurboDisc to a "common" accounting software system with Veeco, will prevent or detect on a timely basis any such further occurrence.

Item 13. Certain Relationships and Related Transactions

4. *In future filings, please describe in detail the material terms of the agreement with Mr. Scherr, such as the length of the agreement, payment terms and what "certain other matters" cover. Also, please file this agreement as an exhibit.*

RESPONSE: Mr. Scherr did not stand for reelection upon expiration of his term as a Director which expired at the Company's Annual Meeting of Stockholders held on May 25, 2005. Furthermore, Mr. Scherr is not an officer of the Company or other person covered by Item 404 of Regulation S-K. As such, disclosure of the terms of his agreement or filing the agreement as an exhibit in future filings would not be required by Item 601 of Regulation S-K.

For your information, the prior agreement between the Company and Mr. Scherr provided for (a) a one-year duration, renewable upon mutual agreement,

(b) payments to Mr. Scherr of approximately \$7,500 per month, and (c) consulting services to be provided by Mr. Scherr contemplated to be approximately 80 hours per month related to acquisitions, new business opportunities and such other matters as mutually agreed by the Company and Mr. Scherr.

5. *In future filings, please discuss the nature of the services provided by Mr. Simone.*

RESPONSE: The Company will disclose the nature of services previously provided by Mr. Simone in future filings. These services included market analysis, evaluation of new business opportunities and related due diligence.

Consolidated Statements of Operations, page F-6

6. *We note your disclosure on page 12 that approximately 17% of your net sales for the year ended December 31, 2004 constituted revenues from part sales, service and support. If service revenue is in excess of 10% of your total revenue in future filings, revise this statement to separately present service revenues and the related cost of services as required by Item 5-03(b)(1) and (2) of Regulation S-X.*

RESPONSE: Service revenue did not constitute in excess of 10% of the Company's total revenues for any of the fiscal years ended 2002, 2003 or 2004.

Note 1. Description of Business and Significant Accounting Policies, page F-9

Long-Lived Assets, page F-11

7. *Please revise future filings to include the disclosures required by paragraph 45(a) and (b) of SFAS 142 related to your intangible assets.*

RESPONSE: The Company has reviewed paragraph 45(a) and (b) of SFAS 142 related to intangible assets and, for the Staff's convenience, has included such requirements below with the Company's response.

FAS 142

45. The following information shall be disclosed in the financial statements or the notes to the financial statements for each period for which a statement of position is presented:

a. For intangible assets subject to amortization:

(1) The gross carrying amount and accumulated amortization, in total and by major intangible asset class.

RESPONSE: The Company discloses this information in its consolidated balance sheets (page F-5) for each major class of intangible assets (purchased

technology and other intangible assets). The Company defines each major class of intangible asset as those greater than 5% of total assets, in accordance with Sections 5-02.15 and 5-02.16 of Regulation S-X.

- (2) The aggregate amortization expense for the period.

RESPONSE: The Company discloses this information in its consolidated statements of operations (page F-6).

- (3) The estimated aggregate amortization expense for each of the five succeeding fiscal years.

RESPONSE: The Company discloses aggregate amortization expense for each of the five succeeding fiscal years Note 1 - Description of Business and Significant Accounting Policies on page F-11.

- b. For intangible assets not subject to amortization, the total carrying amount and the carrying amount for each major intangible asset class.

RESPONSE: The Company's primary intangible asset not subject to amortization is goodwill. The carrying amount of goodwill is disclosed in the Company's consolidated balance sheets (page F-5). Other intangible assets not subject to amortization are disclosed in Note 2 – Business Combinations and Basis of Presentation (pages F-17 – F-22) under the following headings: Manufacturing Technology, Inc., Emcore Corporation's TurboDisc business and Advanced Imaging, Inc.

Although the Company believes all disclosures required by paragraph 45(a) and (b) of SFAS 142 are being made, it will give consideration to making all such required disclosures in future filings in a single note to its financial statements.

Goodwill, page F-12

8. *Please revise future filings to include the changes in goodwill for each period for which a statement of financial position is presented in accordance with paragraph 45(c) of SFAS 142. We note you currently disclose only the changes in goodwill for the most recent period.*

RESPONSE: The Company accepts the Staff's comment and will revise future filings to disclose changes in goodwill for each period in which a statement of financial position is presented in accordance with paragraph 45(c) of SFAS 142.

Note 2. Business Combinations and Basis of Presentation, page F-17**Manufacturing Technology, Inc., page F-17**

9. *We note that you acquired certain assets and liabilities of Manufacturing Technology, Inc. on October 5, 2004. Please tell us whether these operations were included in your assessment of the effectiveness of you internal controls over financial reporting as of December 31, 2004.*

RESPONSE: In accordance with Question 3 of the Office of the Chief Accountant Division of Corporation Finance, *Management's Report on Internal Control Over Financial Reporting and Certification of Disclosure in Exchange Act Periodic Reports, Frequently Asked Questions* (revised October 6, 2004), the operations of Manufacturing Technology, Inc. ("MTI") were not included in the Company's assessment of the effectiveness of the Company's internal controls over financial reporting as of December 31, 2004. In addition, this acquisition was not significant to the Company's consolidated results. MTI's sales for 2004 and total assets as of December 31, 2004 were less than 1% of the Company's consolidated sales and less than 3% of the Company's consolidated assets.

Note 8. Foreign Operations, Geographic Area and Product Segment Information, page F-37

10. *We note on page F-38 that you evaluate your performance based on EBITA. Please tell us and revise future filings to provide a detailed explanation of your measurements of segment profit or loss in accordance with paragraph 31 of SFAS 131.*

RESPONSE: Paragraph 31(b) of SFAS 131 requires disclosure of the nature of any differences between the measurements of the reportable segments' profit or losses and the enterprise's consolidated income before income taxes. EBITA is described as earnings before interest, income taxes and amortization with the differences in the measure when compared to consolidated income before income taxes being interest and amortization. In future filings, the Company will describe that EBITA excludes amortization expense and, as required by paragraph 31(b) of SFAS 131, will reconcile EBITA results of the reportable segments to the enterprise's consolidated income before income taxes.

11. *It appears that you are reporting a measure of segment profit for each segment and then reconciling that measurement to EBITA. Please revise future filings to include a reconciliation of your segment profit measure to consolidated income (loss) before income taxes, as required by paragraph 32(b) of SFAS 131.*

RESPONSE: The Company accepts the Staff's comment and, as noted in response to comment 10 (above), the Company will revise future filings to provide such reconciliation.

Attached to this letter is a written statement, dated August 3, 2005, signed by Veeco Instruments Inc. addressed to the Staff to the effect set forth on page 4 of the Staff's July 23, 2005 letter.

Thank you for your assistance regarding this matter. Please contact the undersigned at (212) 836-8261 or Hillary F. Jassey at (212) 836-7799 with any further comments or questions you may have.

Sincerely,

/s/ Rory A. Greiss

Rory A. Greiss

cc: Thomas Dyer
Kevin Vaughn
John F. Rein, Jr.
John P. Kiernan
Gregory A. Robbins, Esq.
Gary Reifert
Hillary F. Jassey, Esq.